



5-year warranty

## Type overview

Type	DN
F780-150SHP	80

## Technical data

Functional data	
Valve Size	3" [80]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	-22...400°F [-30...204°C]
Body Pressure Rating	ANSI Class 150
Close-off pressure $\Delta$ ps	285 psi
Flow characteristic	modified linear, unidirectional
Servicing	maintenance-free
Flow Pattern	3-way Mixing/Diverting
Leakage rate	0%
Controllable flow range	quarter turn, mechanically limited
Cv	228
Maximum Velocity	32 FPS
Lug threads	5/8-11 UNC
Materials	
Valve body	Carbon steel full lug (ASME B16.34)
Stem	17-4 PH stainless steel
Seat	RPTFE
Pipe connection	ASME/ANSI class 150 flange
Bearing	glass backed PTFE
Disc	316 stainless steel
Gland Seal	TFE
Suitable actuators	
Non-Spring	(2*GMB(X)) PRB(X) GMB(X)
Electrical fail-safe	(2*GKB(X)) PKRB(X)

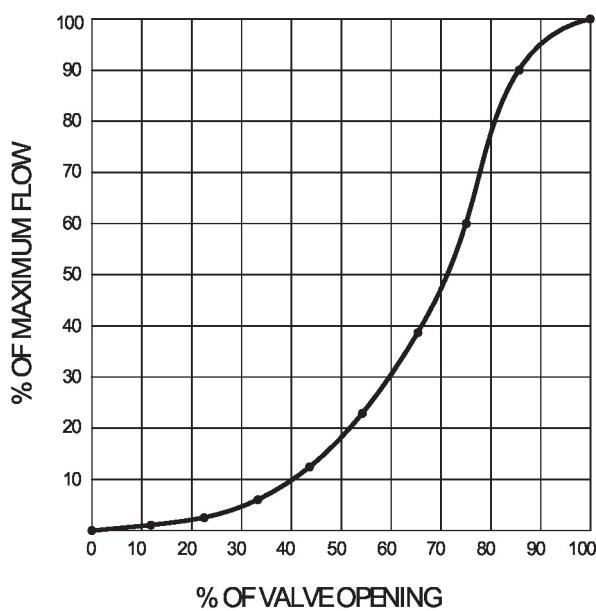
## Safety notes



- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

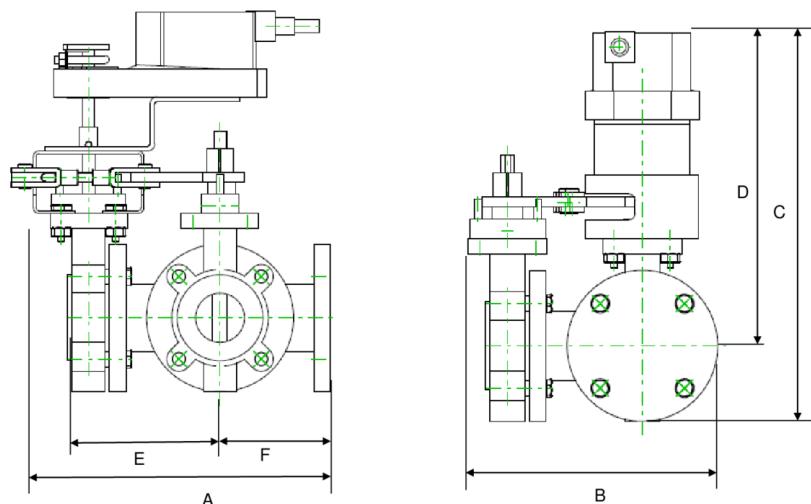
## Product features

## Flow/Mounting details

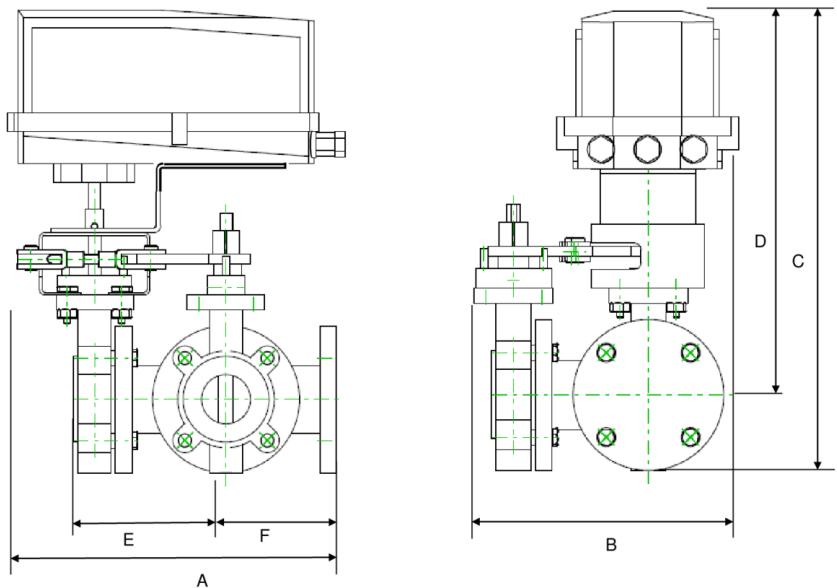


## Dimensions

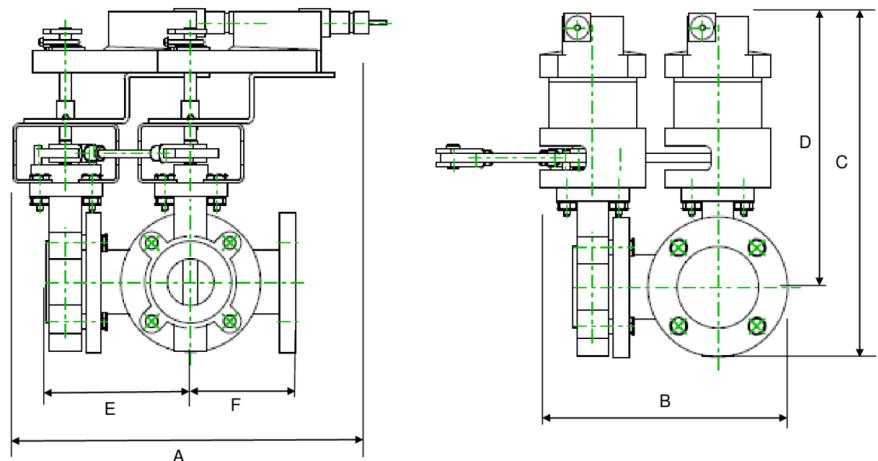
Type	DN
F780-150SHP	80



A	B	C	D	E	F	Number of Bolt Holes
13.4" [340]	11.2" [284]	17.0" [433]	13.2" [336]	7.8" [199]	5.5" [140]	4

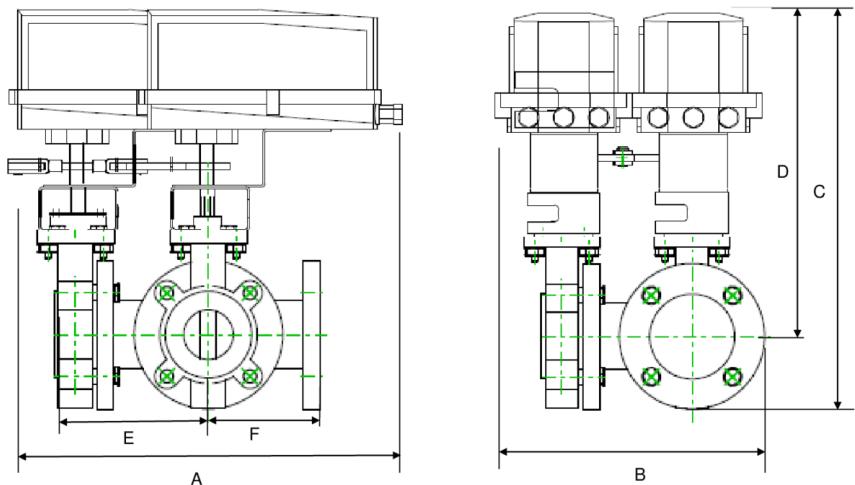


A	B	C	D	E	F	Number of Bolt Holes
17.3" [440]	11.2" [284]	16.3" [415]	12.5" [318]	7.4" [187]	5.5" [140]	4



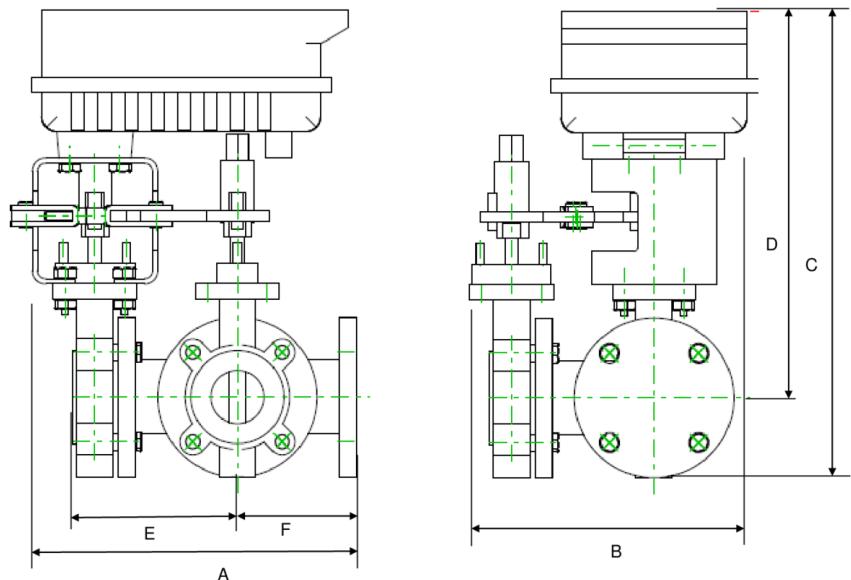
2\*GM/2\*GK

A	B	C	D	E	F	Number of Bolt Holes
20.6" [522]	11.2" [284]	18.3" [464]	14.5" [368]	7.4" [187]	5.5" [140]	4



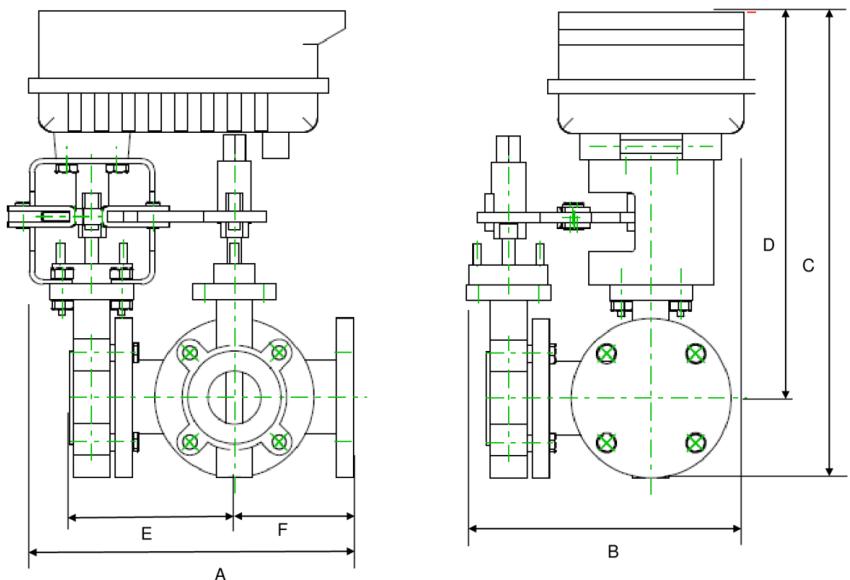
2\*GM

A	B	C	D	E	F	Number of Bolt Holes
15.1" [383]	11.2" [284]	17.0" [433]	13.2" [336]	7.4" [187]	5.5" [140]	4



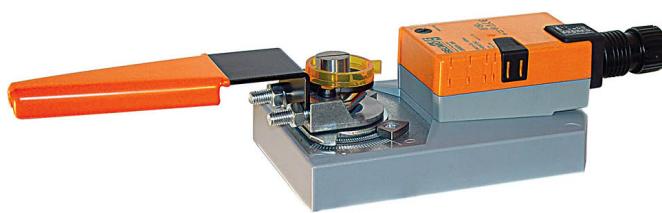
PR

A	B	C	D	E	F	Number of Bolt Holes
15.1" [383]	11.2" [284]	16.3" [415]	12.5" [318]	7.4" [187]	5.5" [140]	4



PK

A	B	C	D	E	F	Number of Bolt Holes
15.6" [396]	11.2" [284]	18.3" [464]	14.5" [368]	7.4" [187]	5.5" [140]	4



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	4 W
	Power consumption in rest position	1.5 W
	Transformer sizing	7 VA
	Electrical Connection	18 GA plenum cable, 1 m, with 1/2" conduit connector (3 m and 5 m available)
	Overload Protection	electronic throughout 0...95° rotation
Functional data	Torque motor	40 Nm
	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA, 1500 Ω for PWM, On/Off and Floating point
	Operating range Y variable	Start point 0.5...30 V End point 2.5...32 V
	Operating modes optional	variable (VDC, on/off, floating point)
	Position feedback U	2...10 V
	Position feedback U note	Max. 0.5 mA
	Position feedback U variable	VDC variable
	Direction of motion motor	selectable with switch 0/1
	Manual override	external push button
	Angle of rotation	Max. 95°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	150 s / 90°
	Running time motor variable	90...150 s
	Noise level, motor	45 dB(A)
	Position indication	Mechanically, 30...65 mm stroke
Safety data	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]

<b>Safety data</b>	Servicing		maintenance-free
<b>Weight</b>	Weight		3.5 lb [1.6 kg]
<b>Materials</b>	Housing material		Galvanized steel and plastic housing

**Footnotes** †Rated Impulse Voltage 800V, Type action 1, Control Pollution Degree 3.

## Accessories

Electrical accessories	Description	Type
Battery backup system, for non-spring return models		NSV24 US
Battery, 12 V, 1.2 Ah (two required)		NSV-BAT
Belimo PC-Tool, Software for adjustments and diagnostics		MFT-P
Feedback potentiometer 140 $\Omega$ add-on, grey		P140A GR
Feedback potentiometer 500 $\Omega$ add-on, grey		P500A GR
Feedback potentiometer 1 k $\Omega$ add-on, grey		P1000A GR
Feedback potentiometer 2.8 k $\Omega$ add-on, grey		P2800A GR
Feedback potentiometer 5 k $\Omega$ add-on, grey		P5000A GR
Feedback potentiometer 10 k $\Omega$ add-on, grey		P10000A GR
Auxiliary switch 1 x SPDT add-on		S1A
Auxiliary switch 2 x SPDT add-on		S2A
Connection cable 16 ft [5 m], A: RJ11 6/4 ZTH EU, B: free wire end for connection to MP/PP terminal		ZK2-GEN
Service Tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices		ZTH US

## Electrical installation

### **INSTALLATION NOTES**

-  **A** Actuators with appliance cables are numbered.
-  **1** Provide overload protection and disconnect as required.
-  **3** Actuators may also be powered by DC 24 V.
-  **5** Only connect common to negative (-) leg of control circuits.
-  **7** A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
-  **8** Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 V line.
-  **10** For triac sink the Common connection from the actuator must be connected to the Hot connection of the controller. Position feedback cannot be used with a triac sink controller; the actuator internal common reference is not compatible.
-  **12** IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).
-  **16** Actuators may be controlled in parallel. Current draw and input impedance must be observed.
-  **47** Master-Slave wiring required for piggy-back applications. Feedback from Master to control input(s) of Slave(s).

 Meets cULus requirements without the need of an electrical ground connection.

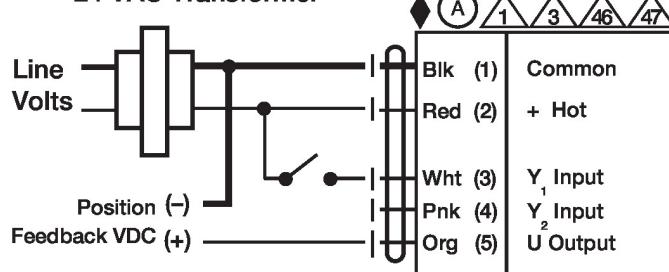
### **Warning! Live electrical components!**

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

## Wiring diagrams

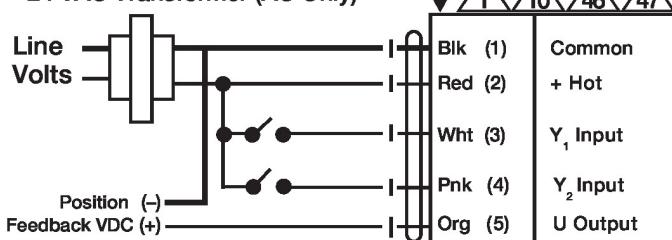
On/Off

## 24 VAC Transformer

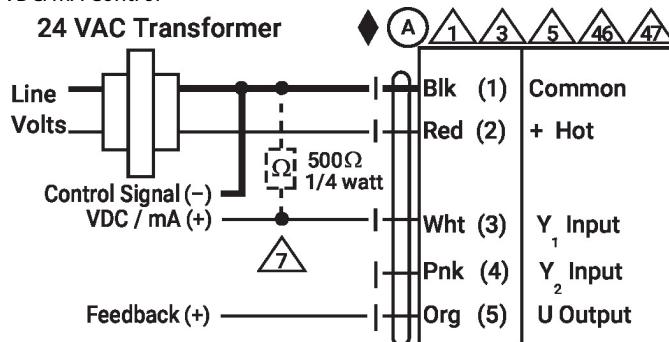


## Floating Point

## 24 VAC Transformer (AC Only)

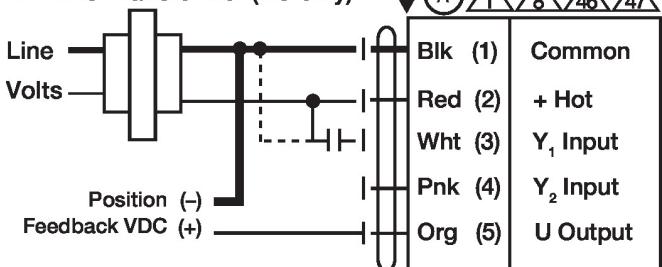


## VDC/mA Control

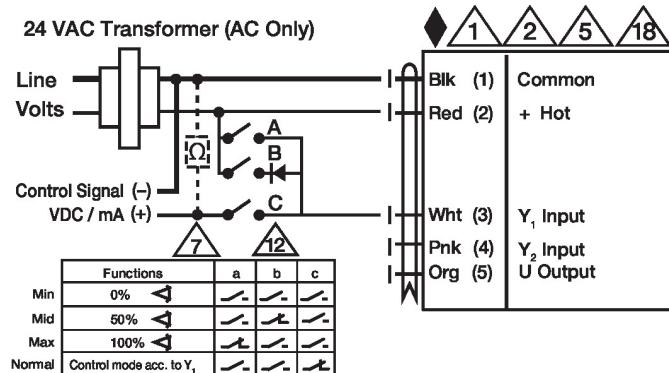


## PWM Control

## 24 VAC Transformer (AC only)



## Override Control



## Primary - Secondary

